SOLUCIÓN DE DOS ESTUDIOS DE CASO BAJO EL USO DE TECNOLOGÍA CISCO.

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INGENIERÍA DE SISTEMAS

BARRANQUILLA

2019

SOLUCIÓN DE DOS ESTUDIOS DE CASO BAJO EL USO DE TECNOLOGÍA CISCO.

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Diplomado de opción de grado presentado para optar el título de INGENIERO DE SISTEMAS

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NOTA DE ACEPTACIÓN

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Firma del Jurado

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Firma del Jurado

BARRANQUILLA, 23 de mayo de 2019

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GLOSARIO

ADSL - Línea digital de suscriptor asincrona: Una variante DSL en la que el tráfico es transmitido a diferentes velocidades en diferentes direcciones.

Ancho de Banda: Es la diferencia entre las frecuencias más alta y más baja capaz de ser llevadas por un canal.

Cortafuegos: Elemento de hardware o software utilizado en una red de computadores para prevenir algunos tipos de comunicaciones prohibidos según las políticas de red que se hayan definido en función de las necesidades de la organización responsable de la red.

Dirección IP: Una dirección en la red asignada a una in-terfaz de un nodo de la red y usada para identificar (localizar) en forma única el nodo dentro de la Internet.

Enrutador: (del inglés Router). Dispositivo hardware o software de interconexión de redes de computadores que opera en la capa tres (nivel de red) del modelo OSI. Este dispositivo interconecta segmentos de red o redes enteras.

Internet: Cuando se usa como nombre y se deletrea con 1 minúscula, "internet" es una abreviación para red inter-conectada, que se refiere a una colección de redes interco-nectadas que funcionan como una sola red.

LAN: Una red local es la interconexión de varios computadores y periféricos.

Red de área amplia (WAN): Una red que interconecta recursos de computadoras que están geográficamente ampliamente separadas (usualmente a más de 100 km). Esto incluye pueblos, ciudades, estados y condados. Un WAN cubre generalmente un área mayor que 5 millas (8 km) y puede considerarse que consiste en una colección de LAN.

Switch: Dispositivo de interconexión de redes de computadores que opera en la capa 2 (nivel de enlace de datos) del modelo OSI (Open Systems Interconection).
TCP: Protocolo que fue creado entre los años 1973 - 1974 (por Vint Cerf y Robert Kahn) es uno de los protocolos fundamentales en Internet.

UDP: Protocolo del nivel de transporte basado en el intercambio de datagramas.

RESUMEN

En esta actividad se trabajaran los diferentes protocolos que aseguren la busqueda de la identificación del grado de desarrollo de competencias y habilidades que fueron adquiridas a lo largo del diplomado. Lo esencial es poner a prueba los niveles de comprensión y solución de problemas relacionados con diversos aspectos de Networking.

Palabras Clave: CISCO, CCNA, Conmutación, Enrutamiento, Redes, Electrónica.

ABSTRACT

In this activity, the different protocols that ensure the search for the identification of the degree of development of competencies and skills that were acquired throughout the diploma are worked on. The essential thing is to test the levels of understanding and solving problems related to various aspects of Networking.

Keywords: CISCO, CCNA, Routing, Switching, Networking, Electronics.

INTRODUCCIÓN

La evaluación denominada "Prueba de habilidades prácticas", forma parte de las actividades evaluativas del Diplomado de Profundización CCNA, y busca identificar el grado de desarrollo de competencias y habilidades que fueron adquiridas a lo largo del diplomado. Lo esencial es poner a prueba los niveles de comprensión y solución de problemas relacionados con diversos aspectos de Networking.

A continuación se elaboran dos escenarios correspondientes a la temática de implementación de soluciones soportadas en enrutamiento avanzado como etapa final del curso Diplomado de Profundización CCNA.

DESARROLLO DE LOS ESCENARIOS

Escenario 1.

Este escenario plantea el uso de RIP como protocolo de enrutamiento, considerando que se tendran rutas por defecto redistribuidas; asimismo, habilitar el encapsulamiento PPP y su autenticación.

Los routers Bogota2 y medellin2 proporcionan el servicio DHCP a su propia red LAN y a los routers 3 de cada ciudad.

Debe configurar PPP en los enlaces hacia el ISP, con autenticación.

Debe habilitar NAT de sobrecarga en los routers Bogota1 y medellin1.
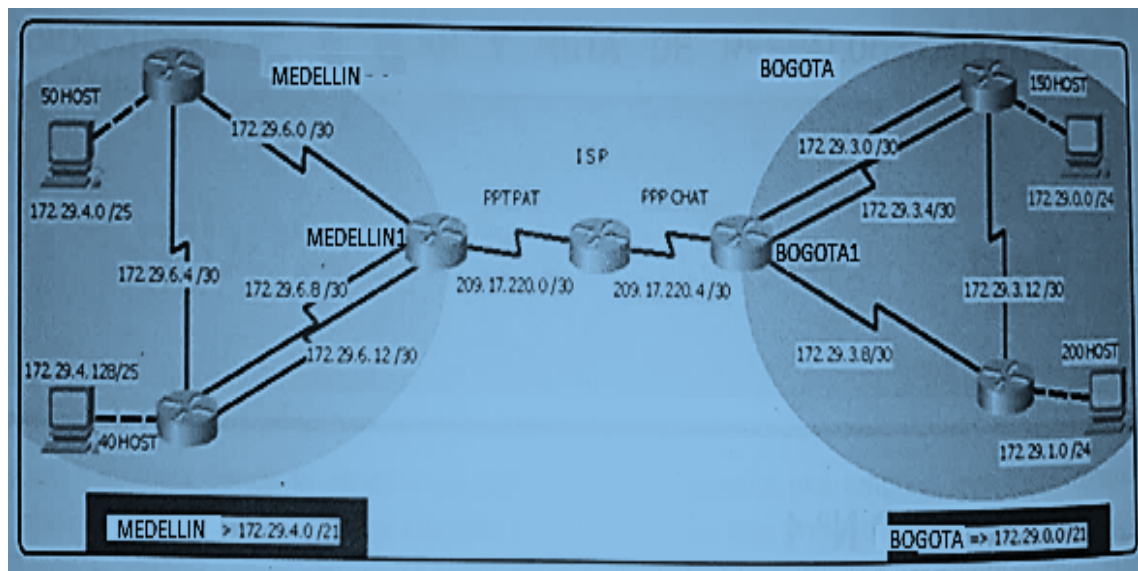
Figura 1. Topología escenario 1
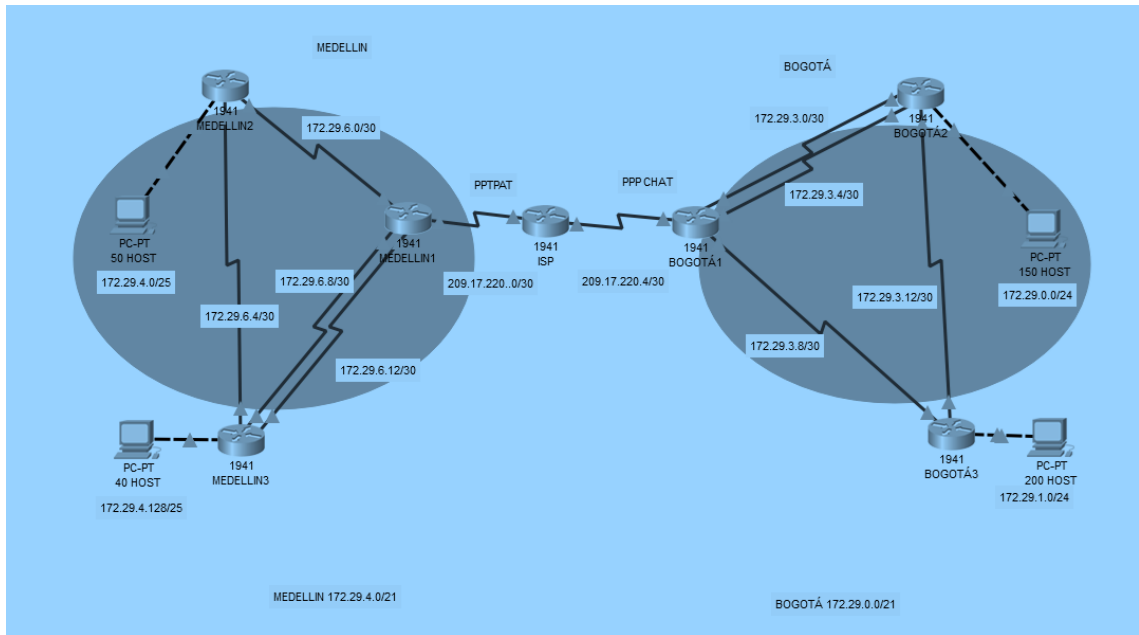
Figura 2. Topología escenario 1 realizada en Packet Tracer.

- Realizar las rutinas de diagnóstico y dejar los equipos listos para su configuración (asignar nombres de equipos, asignar claves de seguridad, etc).

CONFIGURACIÓN BÁSICA ISP

Router>en

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#no ip domain-lookup

Router(config)#hostname ISP

ISP(config)#enable secret class

ISP(config)#line console 0

ISP(config-line)#password cisco

ISP(config-line)#login

ISP(config-line)#logging synchronous

ISP(config-line)#line vty 0 15

ISP(config-line)#password cisco

11

ISP(config-line)#login

ISP(config-line)#logging synchronous

ISP(config)#banner motd #

Enter TEXT message. End with the character '#'.

Prohibido el acceso a personal no autorizado!!!

#

ISP(config)#service password-encryption

CONFIGURACIÓN BÁSICA MEDELLIN1

Router>en

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#no ip domain-lookup

Router(config)#hostname MEDELLIN1

MEDELLIN1(config)#enable secret class

MEDELLIN1(config)#line console 0

MEDELLIN1(config-line)#password cisco

MEDELLIN1(config-line)#login

MEDELLIN1(config-line)#logging synchronous

MEDELLIN1(config-line)#line vty 0 15

MEDELLIN1(config-line)#password cisco

MEDELLIN1(config-line)#login

MEDELLIN1(config-line)#logging synchronous

MEDELLIN1(config)#banner motd #

Enter TEXT message. End with the character '#'.

Prohibido el acceso a personal no autorizado!!!

\#

MEDELLIN1(config)#service password-encryption

CONFIGURACIÓN BÁSICA MEDELLIN2

Router>en

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#no ip domain-lookup

Router(config)#hostname MEDELLIN2

MEDELLIN2(config)#enable secret class

MEDELLIN2(config)#line console 0

MEDELLIN2(config-line)#password cisco

MEDELLIN2(config-line)#login

MEDELLIN2(config-line)#logging synchronous

MEDELLIN2(config-line)#line vty 0 15

MEDELLIN2(config-line)#password cisco

MEDELLIN2(config-line)#login

MEDELLIN2(config-line)#logging synchronous

MEDELLIN2(config)#banner motd #

Enter TEXT message. End with the character '#'.

Prohibido el acceso a personal no autorizado!!!

\#

MEDELLIN2(config)#service password-encryption

CONFIGURACIÓN BÁSICA MEDELLIN3

Router>en

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#no ip domain-lookup

Router(config)#hostname MEDELLIN3

MEDELLIN3(config)#enable secret class

MEDELLIN3(config)#line console 0

MEDELLIN3(config-line)#password cisco

MEDELLIN3(config-line)#login

MEDELLIN3(config-line)#logging synchronous

MEDELLIN3(config-line)#line vty 0 15

MEDELLIN3(config-line)#password cisco

MEDELLIN3(config-line)#login

MEDELLIN3(config-line)#logging synchronous

MEDELLIN3(config)#banner motd #

Enter TEXT message. End with the character '#'.

Prohibido el acceso a personal no autorizado!!!

#

MEDELLIN3(config)#service password-encryption

CONFIGURACIÓN BÁSICA BOGOTA1

Router>en

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#no ip domain-lookup

Router(config)#hostname BOGOTA1

BOGOTA1(config)#enable secret class

BOGOTA1(config)#line console 0

BOGOTA1(config-line)#password cisco

BOGOTA1(config-line)#login

BOGOTA1(config-line)#logging synchronous

BOGOTA1(config-line)#line vty 0 15

BOGOTA1(config-line)#password cisco

BOGOTA1(config-line)#login

BOGOTA1(config-line)#logging synchronous

BOGOTA1(config)#banner motd #

Enter TEXT message. End with the character '#'.

Prohibido el acceso a personal no autorizado!!!

#

BOGOTA1(config)#service password-encryption

CONFIGURACIÓN BÁSICA BOGOTA2

Router>en

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#no ip domain-lookup

Router(config)#hostname BOGOTA2

BOGOTA2(config)#enable secret class

BOGOTA2(config)#line console 0

BOGOTA2(config-line)#password cisco

BOGOTA2(config-line)#login

BOGOTA2(config-line)#logging synchronous

BOGOTA2(config-line)#line vty 0 15

BOGOTA2(config-line)#password cisco

BOGOTA2(config-line)#login

BOGOTA2(config-line)#logging synchronous

BOGOTA2(config)#banner motd #

Enter TEXT message. End with the character '#'.

Prohibido el acceso a personal no autorizado!!!

#

BOGOTA2(config)#service password-encryption

CONFIGURACIÓN BÁSICA BOGOTA3

Router>en

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#no ip domain-lookup

Router(config)#hostname BOGOTA3

BOGOTA3(config)#enable secret class

BOGOTA3(config)#line console 0

BOGOTA3(config-line)#password cisco

BOGOTA3(config-line)#login

BOGOTA3(config-line)#logging synchronous

BOGOTA3(config-line)#line vty 0 15

BOGOTA3(config-line)#password cisco

BOGOTA3(config-line)#login

BOGOTA3(config-line)#logging synchronous

BOGOTA3(config)#banner motd #

Enter TEXT message. End with the character '#'.

Prohibido el acceso a personal no autorizado!!!

#

BOGOTA3(config)#service password-encryption

ENRUTAMIENTO MEDELLIN3

MEDELLIN3(config-if)#ip address 172.29.6.5 255.255.255.252

MEDELLIN3(config-if)#no shutdown

MEDELLIN3(config-if)#

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

MEDELLIN3(config-if)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed
state to up

MEDELLIN3(config-if)#int s0/1/0

MEDELLIN3(config-if)#ip address 172.29.6.9 255.255.255.252

MEDELLIN3(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down

MEDELLIN3(config-if)#int s0/1/1

MEDELLIN3(config-if)#ip address 172.29.6.13 255.255.255.252

MEDELLIN3(config-if)#no shutdown

ENRUTAMIENTO MEDELLIN2

MEDELLIN2(config)#

MEDELLIN2(config)#int s0/0/1

MEDELLIN2(config-if)#ip address 172.29.6.6 255.255.255.252

MEDELLIN2(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down

MEDELLIN2(config-if)#int s0/0/0

MEDELLIN2(config-if)#ip address 172.29.6.2 255.255.255.252

MEDELLIN2(config-if)#no shutdown

ENRUTAMIENTO MEDELLIN1

MEDELLIN1(config)#int s0/0/0

MEDELLIN1(config-if)#ip address 172.29.6.1 255.255.255.252

MEDELLIN1(config-if)#no shutdown

MEDELLIN1(config-if)#

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

MEDELLIN1(config-if)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up

MEDELLIN1(config-if)#int s0/1/0

MEDELLIN1(config-if)#ip address 172.29.6.10 255.255.255.252

MEDELLIN1(config-if)#no shutdown

MEDELLIN1(config-if)#

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up

MEDELLIN1(config-if)#int s0/1/1

MEDELLIN1(config-if)#ip address 172.29.6.14 255.255.255.252

MEDELLIN1(config-if)#no shutdown

MEDELLIN1(config-if)#

%LINK-5-CHANGED: Interface Serial0/1/1, changed state to up

MEDELLIN1(config-if)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/1, changed state to up

MEDELLIN1(config)#int s0/0/1

MEDELLIN1(config-if)#ip address 209.17.220.2 255.255.255.252

MEDELLIN1(config-if)#no shutdown

ENRUTAMIENTO BOGOTA3

BOGOTA3(config)#int s0/0/0

BOGOTA3(config-if)#ip address 172.29.3.14 255.255.255.252

BOGOTA3(config-if)#no shutdown

BOGOTA3(config-if)#

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

BOGOTA3(config-if)#int s0/1/1

BOGOTA3(config-if)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

BOGOTA3(config-if)#ip address 172.29.3.10 255.255.255.252

BOGOTA3(config-if)#no shutdown

ENRUTAMIENTO BOGOTA2

BOGOTA2(config)#int s0/0/0

BOGOTA2(config-if)#ip address 172.29.3.13 255.255.255.252

BOGOTA2(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down

BOGOTA2(config-if)#int s0/0/1

BOGOTA2(config-if)#ip address 172.29.3.1 255.255.255.252

BOGOTA2(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down

BOGOTA2(config-if)#int s0/1/0

BOGOTA2(config-if)#ip address 172.29.3.5 255.255.255.252

BOGOTA2(config-if)#no shutdown

ENRUTAMIENTO BOGOTA1

BOGOTA1(config)#int s0/1/1

BOGOTA1(config-if)#ip address 172.29.3.9 255.255.255.252

BOGOTA1(config-if)#no shutdown

BOGOTA1(config-if)#

%LINK-5-CHANGED: Interface Serial0/1/1, changed state to up

BOGOTA1(config-if)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/1, changed
state to up

BOGOTA1(config-if)#int s0/1/0

BOGOTA1(config-if)#no ip address 172.29.3.2 255.255.255.252

BOGOTA1(config-if)#ip address 172.29.3.6 255.255.255.252

BOGOTA1(config-if)#no shutdown

BOGOTA1(config-if)#

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up

BOGOTA1(config-if)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up

BOGOTA1(config-if)#int s0/0/1

BOGOTA1(config-if)#ip address 172.29.3.2 255.255.255.252

BOGOTA1(config-if)#no shutdown

BOGOTA1(config-if)#

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

BOGOTA1(config-if)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up

BOGOTA1(config)#int s0/0/0

BOGOTA1(config-if)#ip address 209.17.220.6 255.255.255.252

BOGOTA1(config-if)#no shutdown

ENRUTAMIENTO ISP

ISP(config)#int s0/0/1

ISP(config-if)#ip address 209.17.220.1 255.255.255.252

ISP(config-if)#no shutdown

ISP(config-if)#

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

ISP(config-if)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up

ISP(config-if)#int s0/0/0

ISP(config-if)#ip address 209.17.220.5 255.255.255.252

ISP(config-if)#no shutdown

ISP(config-if)#

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

• Realizar la conexión fisica de los equipos con base en la topología de red

Configurar la topología de red, de acuerdo con las siguientes especificaciones.
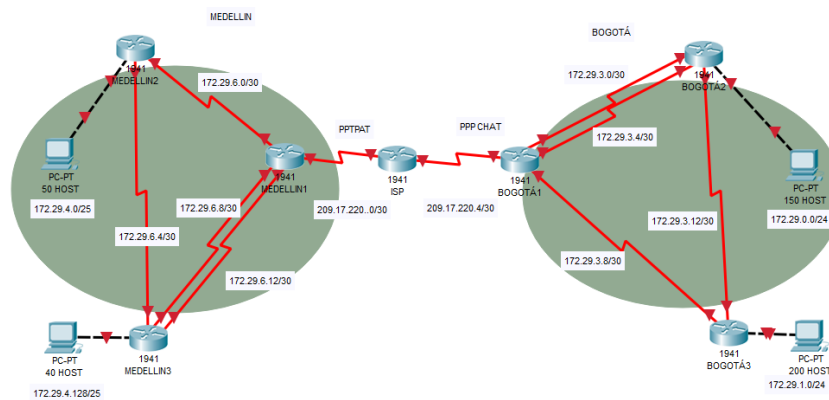

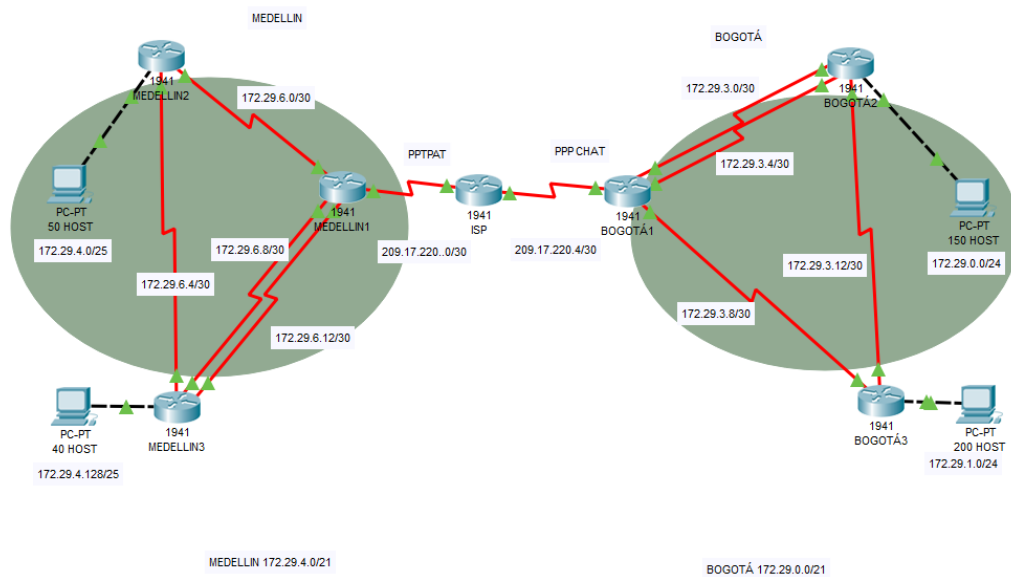Figura 3. Topología escenario 1, conexión sin configuración

Figura 4. Topología escenario 1, conexión y configuración activa

Parte 1: Configuración del enrutamiento

a. Configurar el enrutamiento en la red usando el protocolo RIP versión 2, declare la red principal, desactive la sumarización automática.

b. Verificar el balanceo de carga que presentan los routers.

c. Obsérvese en los routers Bogotá1 y Medellín1 cierta similitud por su ubicación, por tener dos enlaces de conexión hacia otro router y por la ruta por defecto que manejan.

d. Los routers Medellín2 y Bogotá2 también presentan redes conectadas directamente y recibidas mediante RIP.

e. Las tablas de los routers restantes deben permitir visualizar rutas redundantes para el caso de la ruta por defecto.

f. El router ISP solo debe indicar sus rutas estáticas adicionales a las directamente conectadas.

ROUTER RIP V2 MEDELLIN 3

MEDELLIN3(config)#router rip

MEDELLIN3(config-router)#network 172.29.4.128

MEDELLIN3(config-router)#network 172.29.6.4

23

MEDELLIN3(config-router)#network 172.29.6.8

MEDELLIN3(config-router)#network 172.29.6.12

MEDELLIN3(config-router)#version 2

MEDELLIN3(config-router)#no auto-summary

ROUTER RIP V2 MEDELLIN 2

MEDELLIN2(config)#router rip

MEDELLIN2(config-router)#network 172.29.4.0

MEDELLIN2(config-router)#network 172.29.6.4

MEDELLIN2(config-router)#network 172.29.6.0

MEDELLIN2(config-router)#version 2

MEDELLIN2(config-router)#no auto-summary

ROUTER RIP V2 MEDELLIN 1

MEDELLIN1(config)#router rip

MEDELLIN1(config-router)#network 172.29.6.0

MEDELLIN1(config-router)#network 172.29.6.8

MEDELLIN1(config-router)#network 172.29.6.12

MEDELLIN1(config-router)#version 2

MEDELLIN1(config-router)#no auto-summary

ROUTER RIP V2 BOGOTA3

BOGOTA3(config)#router rip

BOGOTA3(config-router)#network 172.29.1.0

BOGOTA3(config-router)#network 172.29.3.8

BOGOTA3(config-router)#network 172.29.3.12

BOGOTA3(config-router)#version 2

BOGOTA3(config-router)#no auto-summary

ROUTER RIP V2 BOGOTA2

BOGOTA2(config)#router rip

BOGOTA2(config-router)#network 172.29.3.0

BOGOTA2(config-router)#network 172.29.3.4

BOGOTA2(config-router)#network 172.29.3.12

BOGOTA2(config-router)#network 172.29.0.0

BOGOTA2(config-router)#version 2

BOGOTA2(config-router)#no auto-summary

ROUTER RIP V2 BOGOTA1

BOGOTA1(config)#router rip

BOGOTA1(config-router)#network 172.29.3.0

BOGOTA1(config-router)#network 172.29.3.4

BOGOTA1(config-router)#network 172.29.3.8

BOGOTA1(config-router)#version 2

BOGOTA1(config-router)#no auto-summary

g. Los routers Bogota1 y Medellín deberán añadir a su configuración de enrutamiento una ruta por defecto hacia el ISP y, a su vez, redistribuirla dentro de las publicaciones de RIP.

MEDELLN1

MEDELLIN1(config)#ip route 0.0.0.0 0.0.0.0 s0/0/1

BOGOTA1

BOGOTA1(config)#ip route 0.0.0.0 0.0.0.0 s0/0/0

ISP

ISP(config)#ip route 209.17.220.0 255.255.255.252 209.17.220.2

ISP(config)#ip route 209.17.220.4 255.255.255.252 209.17.220.6

ISP(config)#router rip

ISP(config-router)#network 209.17.220.0

ISP(config-router)#network 209.17.220.4

ISP(config-router)#version 2

ISP(config-router)#redistribute static

h. El router ISP deberá tener una ruta estática dirigida hacia cada red interna de Bogotá y Medellín para el caso se sumarizan las subredes de cada uno a /22.

Parte 2: Tabla de Enrutamiento.

a. Verificar la tabla de enrutamiento en cada uno de los routers para comprobar las redes y sus rutas.

ROUTER MEDELLIN3

MEDELLIN3#show ip route

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

     D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

     N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

     E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

     i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

     * - candidate default, U - per-user static route, o - ODR

     P - periodic downloaded static route

Gateway of last resort is not set

    172.29.0.0/16 is variably subnetted, 8 subnets, 3 masks

R   172.29.4.0/25 [120/1] via 172.29.6.6, 00:00:17, Serial0/0/1

R   172.29.6.0/30 [120/1] via 172.29.6.10, 00:00:00, Serial0/1/0

                    [120/1] via 172.29.6.6, 00:00:17, Serial0/0/1

                    [120/1] via 172.29.6.14, 00:00:00, Serial0/1/1

C   172.29.6.4/30 is directly connected, Serial0/0/1

L   172.29.6.5/32 is directly connected, Serial0/0/1

C   172.29.6.8/30 is directly connected, Serial0/1/0

L   172.29.6.9/32 is directly connected, Serial0/1/0

C   172.29.6.12/30 is directly connected, Serial0/1/1

L   172.29.6.13/32 is directly connected, Serial0/1/1

ROUTER MEDELLIN2

MEDELLIN2#show ip route

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

      E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

      i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

      * - candidate default, U - per-user static route, o - ODR

      P - periodic downloaded static route

Gateway of last resort is not set

      172.29.0.0/16 is variably subnetted, 8 subnets, 3 masks

C   172.29.4.0/25 is directly connected, GigabitEthernet0/0

L   172.29.4.1/32 is directly connected, GigabitEthernet0/0

C   172.29.6.0/30 is directly connected, Serial0/0/0

L   172.29.6.2/32 is directly connected, Serial0/0/0

C   172.29.6.4/30 is directly connected, Serial0/0/1

L   172.29.6.6/32 is directly connected, Serial0/0/1

R   172.29.6.8/30 [120/1] via 172.29.6.5, 00:00:02, Serial0/0/1

                    [120/1] via 172.29.6.1, 00:00:10, Serial0/0/0

R   172.29.6.12/30 [120/1] via 172.29.6.5, 00:00:02, Serial0/0/1

[120/1] via 172.29.6.1, 00:00:10, Serial0/0/0

ROUTER MEDELLIN1

MEDELLIN1#show ip route

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

      E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

      i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

      * - candidate default, U - per-user static route, o - ODR

      P - periodic downloaded static route

Gateway of last resort is 0.0.0.0 to network 0.0.0.0

    172.29.0.0/16 is variably subnetted, 8 subnets, 3 masks

R   172.29.4.0/25 [120/1] via 172.29.6.2, 00:00:04, Serial0/0/0

C   172.29.6.0/30 is directly connected, Serial0/0/0

L   172.29.6.1/32 is directly connected, Serial0/0/0

R   172.29.6.4/30 [120/1] via 172.29.6.13, 00:00:08, Serial0/1/1

                [120/1] via 172.29.6.9, 00:00:08, Serial0/1/0

                [120/1] via 172.29.6.2, 00:00:04, Serial0/0/0

C   172.29.6.8/30 is directly connected, Serial0/1/0

L   172.29.6.10/32 is directly connected, Serial0/1/0

C   172.29.6.12/30 is directly connected, Serial0/1/1

L   172.29.6.14/32 is directly connected, Serial0/1/1

    209.17.220.0/24 is variably subnetted, 2 subnets, 2 masks

C   209.17.220.0/30 is directly connected, Serial0/0/1

L   209.17.220.2/32 is directly connected, Serial0/0/1

S* 0.0.0.0/0 is directly connected, Serial0/0/1

ROUTER BOGOTA3

BOGOTA3#show ip route

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

     D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

     N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

     E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

     i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

     * - candidate default, U - per-user static route, o - ODR

     P - periodic downloaded static route

Gateway of last resort is not set

     172.29.0.0/16 is variably subnetted, 6 subnets, 2 masks

R   172.29.3.0/30 [120/1] via 172.29.3.9, 00:00:04, Serial0/1/1

                [120/1] via 172.29.3.13, 00:00:09, Serial0/0/0

R   172.29.3.4/30 [120/1] via 172.29.3.9, 00:00:04, Serial0/1/1

                [120/1] via 172.29.3.13, 00:00:09, Serial0/0/0

C   172.29.3.8/30 is directly connected, Serial0/1/1

L   172.29.3.10/32 is directly connected, Serial0/1/1

C   172.29.3.12/30 is directly connected, Serial0/0/0

L   172.29.3.14/32 is directly connected, Serial0/0/0

ROUTER BOGOTA2

BOGOTA2#show ip route

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

     D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

     N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

     E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

     i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

     * - candidate default, U - per-user static route, o - ODR

     P - periodic downloaded static route

Gateway of last resort is not set

172.29.0.0/16 is variably subnetted, 7 subnets, 2 masks

C   172.29.3.0/30 is directly connected, Serial0/0/1

L   172.29.3.1/32 is directly connected, Serial0/0/1

C   172.29.3.4/30 is directly connected, Serial0/1/0

L   172.29.3.5/32 is directly connected, Serial0/1/0

R   172.29.3.8/30 [120/1] via 172.29.3.14, 00:00:12, Serial0/0/0

                [120/1] via 172.29.3.2, 00:00:02, Serial0/0/1

                [120/1] via 172.29.3.6, 00:00:02, Serial0/1/0

C   172.29.3.12/30 is directly connected, Serial0/0/0

L   172.29.3.13/32 is directly connected, Serial0/0/0

ROUTER BOGOTA1

BOGOTA1#show ip route

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

    D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

    N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

    E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

    i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

    * - candidate default, U - per-user static route, o - ODR

    P - periodic downloaded static route

Gateway of last resort is 0.0.0.0 to network 0.0.0.0

172.29.0.0/16 is variably subnetted, 7 subnets, 2 masks

C   172.29.3.0/30 is directly connected, Serial0/0/1

L   172.29.3.2/32 is directly connected, Serial0/0/1

C   172.29.3.4/30 is directly connected, Serial0/1/0

L   172.29.3.6/32 is directly connected, Serial0/1/0

C   172.29.3.8/30 is directly connected, Serial0/1/1

L   172.29.3.9/32 is directly connected, Serial0/1/1

R   172.29.3.12/30 [120/1] via 172.29.3.5, 00:00:09, Serial0/1/0

               [120/1] via 172.29.3.1, 00:00:09, Serial0/0/1

               [120/1] via 172.29.3.10, 00:00:13, Serial0/1/1

    209.17.220.0/24 is variably subnetted, 2 subnets, 2 masks

C   209.17.220.4/30 is directly connected, Serial0/0/0

L   209.17.220.6/32 is directly connected, Serial0/0/0

S* 0.0.0.0/0 is directly connected, Serial0/0/0

ROUTER ISP

ISP#show ip route

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

    D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

    N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

    E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

    i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

    * - candidate default, U - per-user static route, o - ODR

    P - periodic downloaded static route

Gateway of last resort is not set

    209.17.220.0/24 is variably subnetted, 4 subnets, 2 masks

C   209.17.220.0/30 is directly connected, Serial0/0/1

L   209.17.220.1/32 is directly connected, Serial0/0/1

C   209.17.220.4/30 is directly connected, Serial0/0/0

L   209.17.220.5/32 is directly connected, Serial0/0/0

Parte 3: Deshabilitar la propagación del protocolo RIP.

a. Para no propagar las publicaciones por interfaces que no lo requieran se debe deshabilitar la propagación del protocolo RIP, en la siguiente tabla se indican las interfaces de cada router que no necesitan desactivación.

ROUTER	INTERFAZ
Bogota1	SERIAL0/0/1; SERIAL0/1/0; SERIAL0/1/1
Bogota2	SERIAL0/0/0; SERIAL0/0/1
Bogota3	SERIAL0/0/0; SERIAL0/0/1; SERIAL0/1/0
Medellín1	SERIAL0/0/0; SERIAL0/0/1; SERIAL0/1/1
Medellín2	SERIAL0/0/0; SERIAL0/0/1
Medellín3	SERIAL0/0/0; SERIAL0/0/1; SERIAL0/1/0
ISP	No lo requiere

Tabla 1. Interfaces de cada router que no necesitan desactivación.

MEDELLIN3(config-router)#passive-interface s0/0/0

MEDELLIN2(config-router)#passive-interface s0/1/0

MEDELLIN2(config-router)#passive-interface s0/1/1

MEDELLIN1(config-router)#passive-interface s0/0/1

BOGOTA3(config-router)#passive-interface s0/0/1

BOGOTA3(config-router)#passive-interface s0/1/0

BOGOTA2(config-router)#passive-interface s0/1/1

BOGOTA1(config-router)#passive-interface s0/0/0

Parte 4: Verificación del protocolo RIP.

a. Verificar y documentar las opciones de enrutamiento configuradas en los routers, como el **passive interface** para la conexión hacia el ISP, la versión de RIP y las interfaces que participan de la publicación entre otros datos.

ROUTER MEDELLIN3

MEDELLIN3#show ip int

GigabitEthernet0/0 is up, line protocol is up (connected)

  Internet protocol processing disabled

GigabitEthernet0/1 is administratively down, line protocol is down (disabled)

Internet protocol processing disabled

Serial0/0/0 is administratively down, line protocol is down (disabled)

Internet protocol processing disabled

Serial0/0/1 is up, line protocol is up (connected)

Internet address is 172.29.6.5/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Serial0/1/0 is up, line protocol is up (connected)

Internet address is 172.29.6.9/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Serial0/1/1 is up, line protocol is up (connected)

Internet address is 172.29.6.13/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Vlan1 is administratively down, line protocol is down

Internet protocol processing disabled

ROUTER MEDELLIN2

MEDELLIN2#show ip int

GigabitEthernet0/0 is up, line protocol is up (connected)

Internet address is 172.29.4.1/25

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500 bytes

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

BGP Policy Mapping is disabled

Input features: MCI Check

WCCP Redirect outbound is disabled

WCCP Redirect inbound is disabled

WCCP Redirect exclude is disabled

GigabitEthernet0/1 is administratively down, line protocol is down (disabled)

Internet protocol processing disabled

Serial0/0/0 is up, line protocol is up (connected)

Internet address is 172.29.6.2/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Serial0/0/1 is up, line protocol is up (connected)

Internet address is 172.29.6.6/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Serial0/1/0 is administratively down, line protocol is down (disabled)

Internet protocol processing disabled

Serial0/1/1 is administratively down, line protocol is down (disabled)

Internet protocol processing disabled

Vlan1 is administratively down, line protocol is down

Internet protocol processing disabled

ROUTER MEDELLIN1

MEDELLIN1#show ip int

GigabitEthernet0/0 is administratively down, line protocol is down (disabled)

Internet protocol processing disabled

GigabitEthernet0/1 is administratively down, line protocol is down (disabled)

Internet protocol processing disabled

Serial0/0/0 is up, line protocol is up (connected)

Internet address is 172.29.6.1/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Serial0/0/1 is up, line protocol is up (connected)

Internet address is 209.17.220.2/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Serial0/1/0 is up, line protocol is up (connected)

Internet address is 172.29.6.10/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Serial0/1/1 is up, line protocol is up (connected)

Internet address is 172.29.6.14/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Vlan1 is administratively down, line protocol is down

Internet protocol processing disabled

ROUTER BOGOTA3

BOGOTA3#show ip int

GigabitEthernet0/0 is up, line protocol is up (connected)

Internet protocol processing disabled

GigabitEthernet0/1 is administratively down, line protocol is down (disabled)

Internet protocol processing disabled

Serial0/0/0 is up, line protocol is up (connected)

Internet address is 172.29.3.14/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Serial0/0/1 is administratively down, line protocol is down (disabled)

Internet protocol processing disabled

Serial0/1/0 is administratively down, line protocol is down (disabled)

Internet protocol processing disabled

Serial0/1/1 is up, line protocol is up (connected)

Internet address is 172.29.3.10/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Vlan1 is administratively down, line protocol is down

Internet protocol processing disabled

ROUTER BOGOTA2

BOGOTA2#show ip int

GigabitEthernet0/0 is up, line protocol is up (connected)

Internet protocol processing disabled

GigabitEthernet0/1 is administratively down, line protocol is down (disabled)

Internet protocol processing disabled

Serial0/0/0 is up, line protocol is up (connected)

Internet address is 172.29.3.13/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Serial0/0/1 is up, line protocol is up (connected)

Internet address is 172.29.3.1/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Serial0/1/0 is up, line protocol is up (connected)

Internet address is 172.29.3.5/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Serial0/1/1 is administratively down, line protocol is down (disabled)

Internet protocol processing disabled

Vlan1 is administratively down, line protocol is down

Internet protocol processing disabled

ROUTER BOGOTA1

BOGOTA1#show ip int

GigabitEthernet0/0 is administratively down, line protocol is down (disabled)

Internet protocol processing disabled

GigabitEthernet0/1 is administratively down, line protocol is down (disabled)

Internet protocol processing disabled

Serial0/0/0 is up, line protocol is up (connected)

Internet address is 209.17.220.6/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Serial0/0/1 is up, line protocol is up (connected)

Internet address is 172.29.3.2/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Serial0/1/0 is up, line protocol is up (connected)

Internet address is 172.29.3.6/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Serial0/1/1 is up, line protocol is up (connected)

Internet address is 172.29.3.9/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Vlan1 is administratively down, line protocol is down

Internet protocol processing disabled

ROUTER ISP

ISP#show ip int

GigabitEthernet0/0 is administratively down, line protocol is down (disabled)

Internet protocol processing disabled

GigabitEthernet0/1 is administratively down, line protocol is down (disabled)

Internet protocol processing disabled

Serial0/0/0 is up, line protocol is up (connected)

Internet address is 209.17.220.5/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Serial0/0/1 is up, line protocol is up (connected)

Internet address is 209.17.220.1/30

Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachables are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Serial0/1/0 is administratively down, line protocol is down (disabled)

  Internet protocol processing disabled

Serial0/1/1 is administratively down, line protocol is down (disabled)

  Internet protocol processing disabled

Vlan1 is administratively down, line protocol is down

  Internet protocol processing disabled

b. Verificar y documentar la base de datos de RIP de cada router, donde se informa de manera detallada de todas las rutas hacia cada red.

ROUTER MEDELLIN3

  172.29.0.0/16 is variably subnetted, 8 subnets, 3 masks

R   172.29.4.0/25 [120/1] via 172.29.6.6, 00:00:19, Serial0/0/1

R   172.29.6.0/30 [120/1] via 172.29.6.10, 00:00:19, Serial0/1/0

           [120/1] via 172.29.6.6, 00:00:19, Serial0/0/1

           [120/1] via 172.29.6.14, 00:00:19, Serial0/1/1

ROUTER MEDELLIN2

MEDELLIN2#show ip route rip

  172.29.0.0/16 is variably subnetted, 8 subnets, 3 masks

R   172.29.6.8/30 [120/1] via 172.29.6.5, 00:00:25, Serial0/0/1

           [120/1] via 172.29.6.1, 00:00:01, Serial0/0/0

R   172.29.6.12/30 [120/1] via 172.29.6.5, 00:00:25, Serial0/0/1

           [120/1] via 172.29.6.1, 00:00:01, Serial0/0/0

ROUTER MEDELLIN1

MEDELLIN1#show ip route rip

  172.29.0.0/16 is variably subnetted, 8 subnets, 3 masks

R   172.29.4.0/25 [120/1] via 172.29.6.2, 00:00:24, Serial0/0/0

R   172.29.6.4/30 [120/1] via 172.29.6.13, 00:00:17, Serial0/1/1

                [120/1] via 172.29.6.9, 00:00:17, Serial0/1/0

                [120/1] via 172.29.6.2, 00:00:24, Serial0/0/0

        209.17.220.0/24 is variably subnetted, 2 subnets, 2 masks

ROUTER BOGOTA3

BOGOTA3#show ip route rip

        172.29.0.0/16 is variably subnetted, 6 subnets, 2 masks

R   172.29.3.0/30 [120/1] via 172.29.3.9, 00:00:03, Serial0/1/1

                [120/1] via 172.29.3.13, 00:00:20, Serial0/0/0

R   172.29.3.4/30 [120/1] via 172.29.3.9, 00:00:03, Serial0/1/1

                [120/1] via 172.29.3.13, 00:00:20, Serial0/0/0

ROUTER BOGOTA2

BOGOTA2#show ip route rip

        172.29.0.0/16 is variably subnetted, 7 subnets, 2 masks

R   172.29.3.8/30 [120/1] via 172.29.3.14, 00:00:26, Serial0/0/0

                [120/1] via 172.29.3.2, 00:00:27, Serial0/0/1

                [120/1] via 172.29.3.6, 00:00:27, Serial0/1/0

ROUTER BOGOTA1

BOGOTA1#show ip route rip

        172.29.0.0/16 is variably subnetted, 7 subnets, 2 masks

R   172.29.3.12/30 [120/1] via 172.29.3.10, 00:00:04, Serial0/1/1

                [120/1] via 172.29.3.1, 00:00:23, Serial0/0/1

                [120/1] via 172.29.3.5, 00:00:23, Serial0/1/0

        209.17.220.0/24 is variably subnetted, 2 subnets, 2 masks

Escenario 2.

Una empresa de Tecnología posee tres sucursales distribuidas en las ciudades de Miami, Bogotá y Buenos Aires, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos establecidos para el direccionamiento IP, protocolos de enrutamiento y demás aspectos que forman parte de la topología de red.
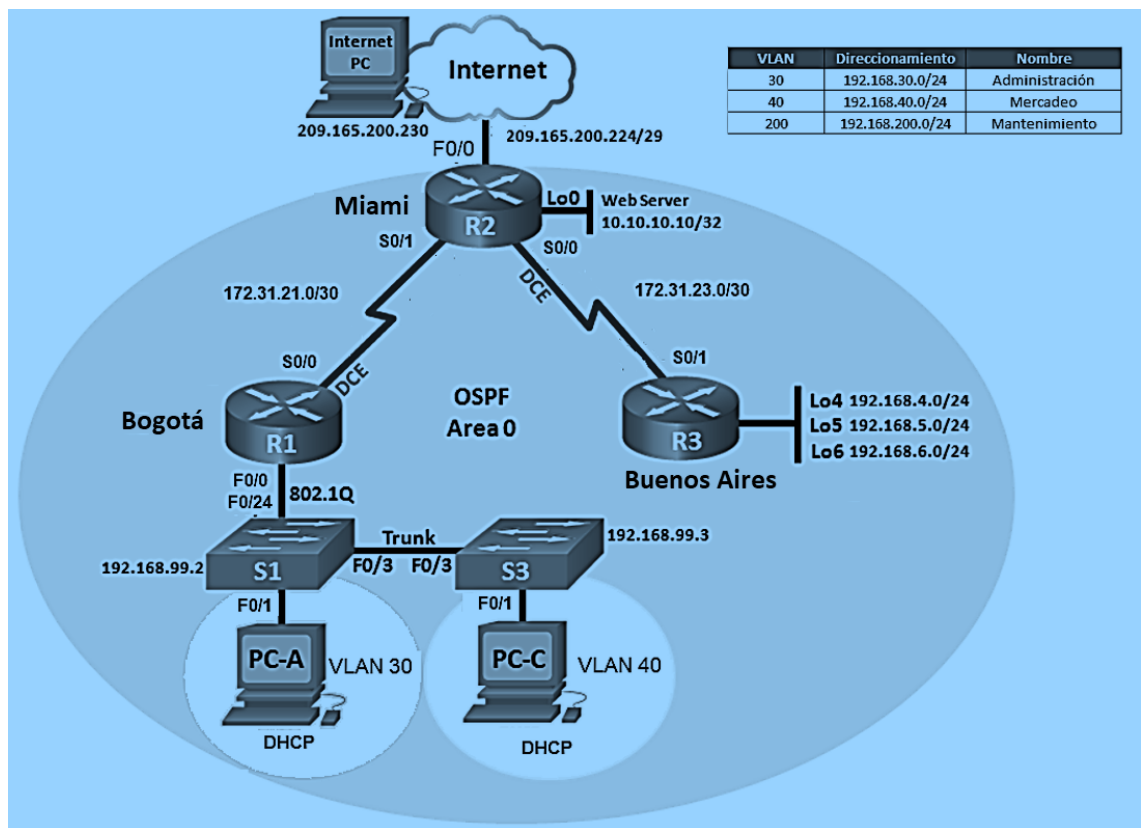

Figura 5. Topología escenario 2 propuesta.

CONFIGURACIONES ESCENARIO 2

1. **Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario**
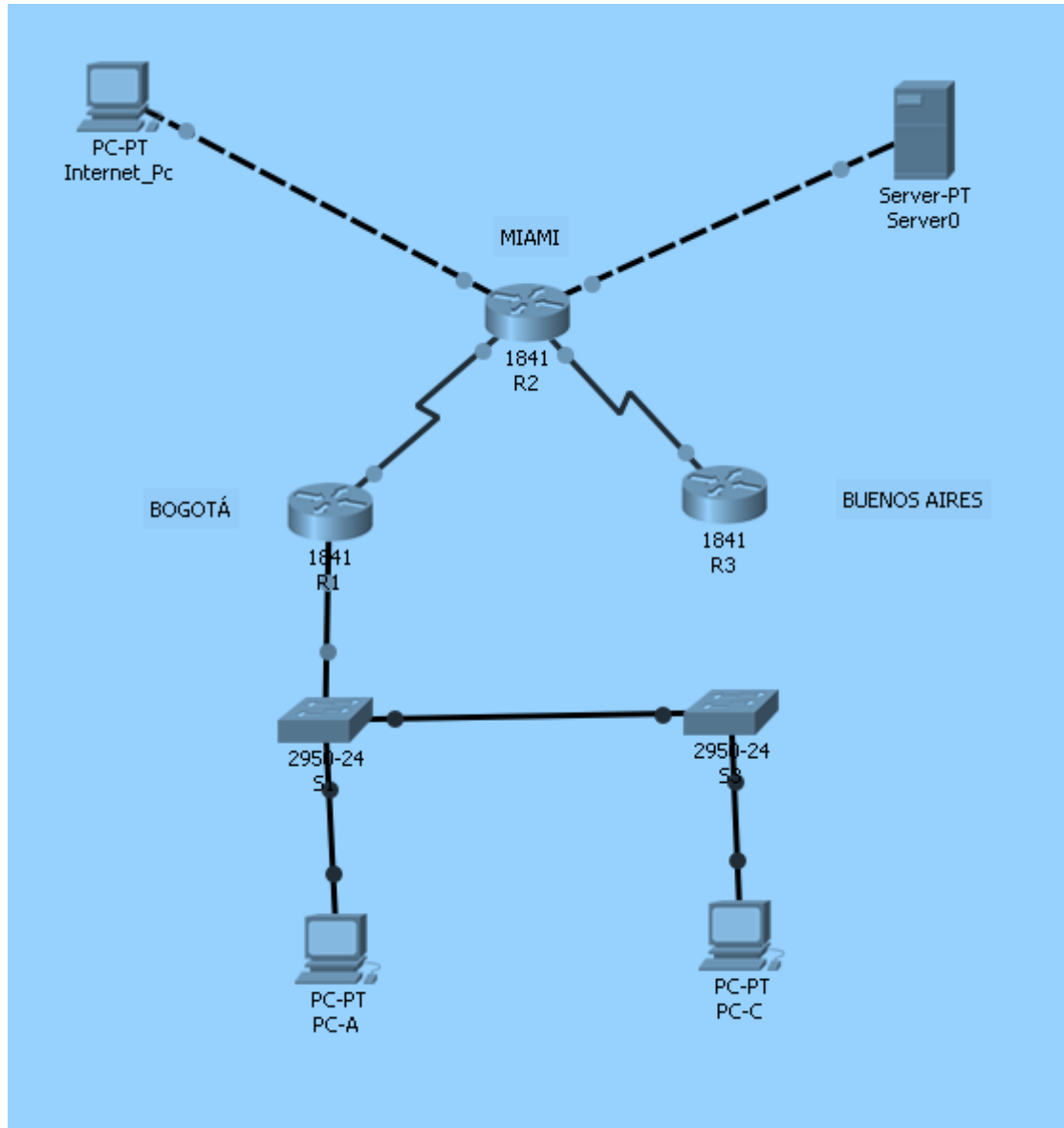

Figura 6. Asignación de los dispositivos que forman parte del escenario 2.

CONFIGURACIÓN BÁSICA R1

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.

```
Router(config)#hostname BOGOTA
BOGOTA(config)#no ip domain-lookup
BOGOTA(config)#enable secret class
BOGOTA(config)#line con 0
BOGOTA(config-line)#password cisco
BOGOTA(config-line)#login
BOGOTA(config-line)#exit
BOGOTA(config)#service password-encryption
BOGOTA(config)#banner motd $ Acceso no autorizado o prohibido!! $
BOGOTA(config)#
```

CONFIGURACIÓN BÁSICA R2

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname MIAMI
MIAMI(config)# no ip domain-lookup
MIAMI(config)#enable secret class
MIAMI(config)#line con 0
MIAMI(config-line)#password cisco
MIAMI(config-line)#login
MIAMI(config-line)#exit
MIAMI(config)#service password-encryption
MIAMI(config)#banner motd $ Acceso no autorizado o prohibido!! $
MIAMI(config)#
```

CONFIGURACIÓN BÁSICA R3

```
Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname BUENOSAIRES
BUENOSAIRES(config)#no ip domain-lookup
BUENOSAIRES(config)#enable secret class
BUENOSAIRES(config)#line con 0
BUENOSAIRES(config-line)#password cisco
BUENOSAIRES(config-line)#login
BUENOSAIRES(config-line)#exit
BUENOSAIRES(config)#service password-encryption
BUENOSAIRES(config)#banner motd $ Acceso no autorizado o prohibido!! $
BUENOSAIRES(config)#
```

CONFIGURACIÓN BÁSICA S1

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
```

Switch(config)#hostname S1
S1(config)#no ip domain-lookup
S1(config)#enable secret class
S1(config)#line con 0
S1(config-line)#password cisco
S1(config-line)#login
S1(config-line)#exit
S1(config)#service password-encryption
S1(config)#banner motd $ Solo personal autorizado!! $
S1(config)#

CONFIGURACIÓN BÁSICA S3

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S3
S3(config)#no ip domain-lookup
S3(config)#enable secret class
S3(config)#line con 0
S3(config-line)#password cisco
S3(config-line)#login
S3(config-line)#exit
S3(config)#service password-encryption
S3(config)#banner motd $ Solo personal autorizado!! $
S3(config)#

2. **Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios:**

OSPFv2 area 0

Configuration Item or Task	Specification
Router ID R1	1.1.1.1
Router ID R2	5.5.5.5
Router ID R3	8.8.8.8
Configurar todas las interfaces LAN como pasivas	
Establecer el ancho de banda para enlaces seriales en	256 Kb/s
Ajustar el costo en la métrica de S0/0 a	9500

Tabla 2. Configuración del protocolo de enrutamiento OSPFv2 en el area 0.

Verificar información de OSPF

BOGOTA(config)#router ospf 1
BOGOTA(config-router)#router-id 1.1.1.1
BOGOTA(config-router)#network 172.31.21.0 0.0.0.3 area 0
BOGOTA(config-router)#network 192.168.30.0 0.0.0.255 area 0
BOGOTA(config-router)#network 192.168.40.0 0.0.0.255 area 0
BOGOTA(config-router)#network 192.168.200.0 0.0.0.255 area 0
BOGOTA(config-router)#

BOGOTA(config-router)#passive-interface f0/0.30
BOGOTA(config-router)#passive-interface f0/0.40
BOGOTA(config-router)#passive-interface f0/0.200
BOGOTA(config-router)#

BOGOTA(config)#int s0/0/0
BOGOTA(config-if)#bandwidth 256
BOGOTA(config-if)#ip ospf cost 9500
BOGOTA(config-if)#

MIAMI(config)#router ospf 1
MIAMI(config-router)#router-id 5.5.5.5
MIAMI(config-router)#network 172.31.21.0 0.0.0.3 area 0
MIAMI(config-router)#
00:16:21: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial0/1/0 from
LOADING to FULL, Loading Done

MIAMI(config-router)#network 172.31.23.0 0.0.0.3 area 0
MIAMI(config-router)#network 10.10.10.0 0.0.0.255 area 0
MIAMI(config-router)#
MIAMI(config-router)#passive-interface f0/1
MIAMI(config-router)#exit
MIAMI(config)#int s0/1/1
MIAMI(config-if)#bandwidth 256
MIAMI(config-if)#ip ospf cost 9500
MIAMI(config-if)#

BUENOSAIRES(config)#router ospf 1
BUENOSAIRES(config-router)#router-id 8.8.8.8
BUENOSAIRES(config-router)#network 172.31.23.0 0.0.0.3 area 0
BUENOSAIRES(config-router)#
00:25:00: %OSPF-5-ADJCHG: Process 1, Nbr 5.5.5.5 on Serial0/0/0 from
LOADING to FULL, Loading Done

BUENOSAIRES(config-router)#network 192.168.4.0 0.0.3.255 area 0
BUENOSAIRES(config-router)#passive-interface lo4

BUENOSAIRES(config-router)#passive-interface lo5
BUENOSAIRES(config-router)#passive-interface lo6
BUENOSAIRES(config-router)#exit
BUENOSAIRES(config)#int s0/0/0
BUENOSAIRES(config-if)#bandwidth 256
BUENOSAIRES(config-if)#ip ospf cost 9500
BUENOSAIRES(config-if)#

```
MIAMI(config)#router ospf 1
MIAMI(config-router)#router-id 5.5.5.5
MIAMI(config-router)#network 172.31.21.0 0.0.0.3 area 0
MIAMI(config-router)#
00:16:21: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial0/1/0
from LOADING to FULL, Loading Done

MIAMI(config-router)#network 172.31.23.0 0.0.0.3 area 0
MIAMI(config-router)#network 10.10.10.0 0.0.0.255 area 0
MIAMI(config-router)#
MIAMI(config-router)#passive-interface f0/1
MIAMI(config-router)#exit
MIAMI(config)#int s0/1/1
MIAMI(config-if)#bandwidth 256
MIAMI(config-if)#ip ospf cost 9500
MIAMI(config-if)#
```

Figura 7. Evidencia de implementación de comandos en el router MIAMI.

```
BOGOTA(config)#router ospf 1
BOGOTA(config-router)#router-id 1.1.1.1
BOGOTA(config-router)#network 172.31.21.0 0.0.0.3 area 0
BOGOTA(config-router)#network 192.168.30.0 0.0.0.255 area 0
BOGOTA(config-router)#network 192.168.40.0 0.0.0.255 area 0
BOGOTA(config-router)#network 192.168.200.0 0.0.0.255 area 0
BOGOTA(config-router)#
```

Figura 8. Evidencia de implementación de comandos en el router BOGOTA.

```
BUENOSAIRES(config)#router ospf 1
BUENOSAIRES(config-router)#router-id 8.8.8.8
BUENOSAIRES(config-router)#network 172.31.23.0 0.0.0.3 area 0
BUENOSAIRES(config-router)#
00:25:00: %OSPF-5-ADJCHG: Process 1, Nbr 5.5.5.5 on Serial0/0/0
from LOADING to FULL, Loading Done

BUENOSAIRES(config-router)#network 192.168.4.0 0.0.3.255 area 0
BUENOSAIRES(config-router)#passive-interface lo4
BUENOSAIRES(config-router)#passive-interface lo5
BUENOSAIRES(config-router)#passive-interface lo6
BUENOSAIRES(config-router)#exit
BUENOSAIRES(config)#int s0/0/0
BUENOSAIRES(config-if)#bandwidth 256
BUENOSAIRES(config-if)#ip ospf cost 9500
```

Figura 9. Evidencia de implementación de comandos en el router BUENOS AIRES.

- **Visualizar tablas de enrutamiento y routers conectados por OSPFv2**

```
MIAMI#show ip ospf neighbor


Neighbor ID      Pri   State            Dead Time   Address
Interface
1.1.1.1           0    FULL/  -         00:00:34    172.31.21.1
Serial0/1/0
8.8.8.8           0    FULL/  -         00:00:31    172.31.23.2
Serial0/1/1
MIAMI#
```

Figura 10. Visualización de los vecinos conectados por OSPFv2 en el router MIAMI.

- **Visualizar lista resumida de interfaces por OSPF en donde se ilustre el costo de cada interface**

```
MIAMI#show ip ospf interface

FastEthernet0/1 is up, line protocol is up
  Internet address is 10.10.10.10/24, Area 0
  Process ID 1, Router ID 5.5.5.5, Network Type BROADCAST, Cost: 1
  Transmit Delay is 1 sec, State WAITING, Priority 1
  No designated router on this network
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    No Hellos (Passive interface)
  Index 1/1, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 0, Adjacent neighbor count is 0
  Suppress hello for 0 neighbor(s)
Serial0/1/1 is up, line protocol is up
  Internet address is 172.31.23.1/30, Area 0
  Process ID 1, Router ID 5.5.5.5, Network Type POINT-TO-POINT, Cost: 9500
  Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
  No designated router on this network
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:00
  Index 2/2, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1 , Adjacent neighbor count is 1
    Adjacent with neighbor 8.8.8.8
  Suppress hello for 0 neighbor(s)
Serial0/1/0 is up, line protocol is up
  Internet address is 172.31.21.2/30, Area 0
  Process ID 1, Router ID 5.5.5.5, Network Type POINT-TO-POINT, Cost: 64
  Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
  No designated router on this network
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:09
  Index 3/3, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1 , Adjacent neighbor count is 1
    Adjacent with neighbor 1.1.1.1
  Suppress hello for 0 neighbor(s)
```

Figura 11. Visualización de los costos de cada interface en la lista resumida de interface por OSPF

- **Visualizar el OSPF Process ID, Router ID, Address summarizations, Routing Networks, and passive interfaces configuradas en cada router**

```
router ospf 1
 router-id 5.5.5.5
 log-adjacency-changes
 passive-interface FastEthernet0/1
 network 172.31.21.0 0.0.0.3 area 0
 network 172.31.23.0 0.0.0.3 area 0
 network 10.10.10.0 0.0.0.255 area 0
```

Figura 12. Visualización de la configuración del proceso ID, router ID, sumarización de direcciones, redes enrutadas y interfaces configuradas en cada router.

3. **Configurar VLANs, Puertos troncales, puertos de acceso, encapsulamiento, Inter-VLAN Routing y Seguridad en los Switches acorde a la topología de red establecida.**

S1(config)#
S1(config)#int f0/3
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#

S1(config)#int f0/24
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#no shutdown
S1(config-if)#

S1(config)#int range fa0/1-2, fa0/4-24
S1(config-if-range)#switchport mode access
S1(config-if-range)#

S1(config)#int f0/1
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 30
S1(config-if)#int range fa0/1-2, fa0/4-24
S1(config-if-range)#shutdown

S1(config)#int vlan 200
S1(config-if)#
%LINK-5-CHANGED: Interface Vlan200, changed state to up

S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#

```
S3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S3(config)#vlan 30
S3(config-vlan)#name ADMINISTRACION
S3(config-vlan)#vlan 40
S3(config-vlan)#name MERCADEO
S3(config-vlan)#vlan 200
S3(config-vlan)#name MANTENIMIENTO
S3(config-vlan)#exit
S3(config)#

S3(config)#int vlan 200

S3(config-if)#
%LINK-5-CHANGED: Interface Vlan200, changed state to up
S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#

S3(config)#ip default-gateway 192.168.99.1
S3(config)#
S3#

S3(config)#int f0/3
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#

S3(config)#int range fa0/1-2, fa0/4-24
S3(config-if-range)#switchport mode access
S3(config-if-range)#

S3(config)#int f0/1
S3(config-if)#switchport mode access
S3(config-if)#switchport access vlan 40
S3(config-if)#int range fa0/1-2, fa0/4-24
S3(config-if-range)#shutdown

BOGOTA(config)#int f0/0.30
BOGOTA(config-subif)#description accounting LAN
BOGOTA(config-subif)#encapsulation dot1q 30
BOGOTA(config-subif)#ip address 192.168.30.1 255.255.255.0
BOGOTA(config-subif)#
BOGOTA(config)#int f0/0.40
BOGOTA(config-subif)#description accounting LAN
BOGOTA(config-subif)#encapsulation dot1q 40
BOGOTA(config-subif)#ip address 192.168.40.1 255.255.255.0
BOGOTA(config-subif)#
BOGOTA(config)#int f0/0.200
BOGOTA(config-subif)#description accounting LAN
BOGOTA(config-subif)#encapsulation dot1q 200
BOGOTA(config-subif)#ip address 192.168.200.1 255.255.255.0
```

BOGOTA(config-subif)#

4. En el Switch 3 deshabilitar DNS lookup

S3(config)#no ip domain-lookup

5. Asignar direcciones IP a los Switches acorde a los lineamientos.

S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#

S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#

S3(config)#ip default-gateway 192.168.99.1
S3(config)#

6. Desactivar todas las interfaces que no sean utilizadas en el esquema de red.

S1(config-if)#int range fa0/1-2, fa0/4-24
S1(config-if-range)#shutdown

S3(config-if)#int range fa0/1-2, fa0/4-24
S3(config-if-range)#shutdown

7. Implement DHCP and NAT for IPv4

MIAMI(config)#user webuser privilege 15 secret cisco12345
MIAMI(config)#ip nat inside source static 10.10.10.10 209.165.200.229
MIAMI(config)#int f0/0
MIAMI(config-if)#ip nat outside
MIAMI(config-if)#exit
MIAMI(config)#int f0/1
MIAMI(config-if)#ip nat inside
MIAMI(config-if)#
MIAMI(config-if)#exit
MIAMI(config)#access-list 1 permit 192.168.30.0 0.0.0.255
MIAMI(config)#access-list 1 permit 192.168.40.0 0.0.0.255
MIAMI(config)#access-list 1 permit 192.168.4.0 0.0.3.255

MIAMI(config)#ip nat pool INTERNET 209.165.200.225 209.165.200.229
netmask 255.255.255.248
MIAMI(config)#

8. Configurar R1 como servidor DHCP para las VLANs 30 y 40.

BOGOTA(config)#ip dhcp pool ADMINISTRACION
BOGOTA(dhcp-config)#dns-server 10.10.10.11
BOGOTA(dhcp-config)#default-router 192.168.30.1
BOGOTA(dhcp-config)#network 192.168.30.0 255.255.255.0
BOGOTA(dhcp-config)#

BOGOTA(config)#ip dhcp pool MERCADEO
BOGOTA(dhcp-config)#dns-server 10.10.10.11
BOGOTA(dhcp-config)#default-router 192.168.40.1
BOGOTA(dhcp-config)#network 192.168.40.0 255.255.255.0
BOGOTA(dhcp-config)#

9. Reservar las primeras 30 direcciones IP de las VLAN 30 y 40 para configuraciones estáticas.

BOGOTA#conf t
Enter configuration commands, one per line. End with CNTL/Z.
BOGOTA(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
BOGOTA(config)#ip dhcp excluded-address 192.168.30.1 192.168.40.30
BOGOTA(config)#

10. Configurar NAT en R2 para permitir que los host puedan salir a internet

MIAMI(config)#int f0/0
MIAMI(config-if)#ip nat outside
MIAMI(config-if)#exit
MIAMI(config)#int f0/1
MIAMI(config-if)#ip nat inside
MIAMI(config-if)#

11. Configurar al menos dos listas de acceso de tipo estándar a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.

MIAMI(config)#access-list 1 permit 192.168.30.0 0.0.0.255
MIAMI(config)#access-list 1 permit 192.168.40.0 0.0.0.255
MIAMI(config)#access-list 1 permit 192.168.4.0 0.0.3.255
MIAMI(config)#ip nat pool INTERNET 209.165.200.225 209.165.200.229
netmask 255.255.255.248

MIAMI(config)#ip access-list standard ADMIN
MIAMI(config-std-nacl)#permit host 172.31.21.1
MIAMI(config-std-nacl)#exit
MIAMI(config)#line vty 0 4
MIAMI(config-line)#access-class ADMIN in
MIAMI(config-line)#

12. Configurar al menos dos listas de acceso de tipo extendido o nombradas a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.

MIAMI(config)#access-list 100 permit tcp any host 209.165.200.229 eq www
MIAMI(config)#access-list 100 permit icmp any any echo-reply

13. Verificar procesos de comunicación y redireccionamiento de tráfico en los routers mediante el uso de Ping y Traceroute.

```
MIAMI#show access-lists
Standard IP access list 1
    10 permit 192.168.30.0 0.0.0.255
    20 permit 192.168.40.0 0.0.0.255
    30 permit 192.168.4.0 0.0.3.255
Standard IP access list ADMIN
    10 permit host 172.31.21.1
Extended IP access list 100
    10 permit tcp any host 209.165.200.229 eq www
    20 permit icmp any any echo-reply
```

```
BOGOTA#ping 209.165.200.230

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 209.165.200.230, timeout is 2
seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 1/5/18
ms

BOGOTA#
```

CONCLUSIONES

De acuerdo con los contenidos vistos dentro del curso Diplomado de Profundización Cisco CCNA, se logra conceptualizar con claridad el término red, que es un conjunto de dispositivos conectados por medio de cables, ondas, señales, y demás métodos de transporte de datos para compartir información y servicios.

El protocolo DHCP es diseñado para ahorrar tiempo en la gestión de direccionamiento IP en una red extensa. Este servicio se encuentra activo en un servidor donde administra las direcciones de la red.

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